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ABSTRACT

This eighth in a series of eight modules for a course titled Quality Assurance Practices describes the records management program for the collection, storage, and maintenance of records. The module follows a typical format that includes the following sections: (1) introduction, (2) module prerequisites, (3) objectives, (4) notes to instructor/student, (5) subject matter, (6) materials needed, (7) procedures, (8) data table, (9) reference materials, (10) test. (The course is one of fifteen technical courses for the second year of a two-year postsecondary curriculum in Nuclear Quality Assurance/Quality Control Technology.) (LRA)

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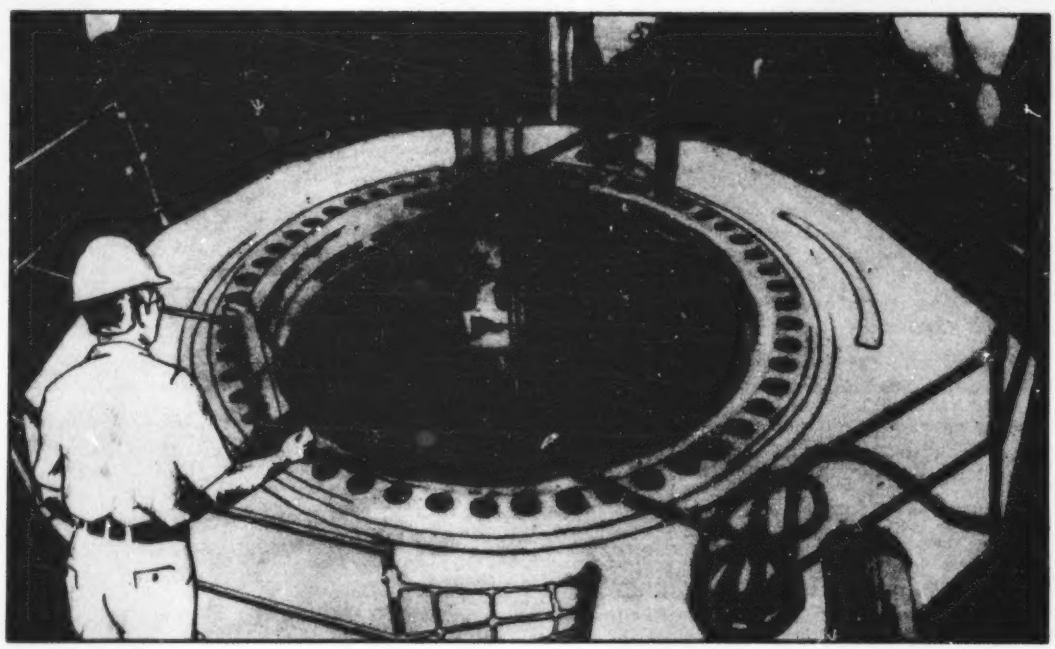
NUCLEAR TECHNOLOGY

COURSE 31 QUALITY ASSURANCE PRACTICES

MODULE 31-8 Document Handling, Storage and Retrieval for Quality Assurance



CE 024 292

GENERAL PHYSICS CORPORATION
Columbia , Maryland

COURSE MODULES

COURSE 31 QUALITY ASSURANCE PRACTICES

Module 31-1	Overall Quality Assurance Program
Module 31-2	Vendor Qualification
Module 31-3	Receiving Inspection
Module 31-4	Identification, Storage and Handling of Components, Parts and Materials
Module 31-5	Non-Conforming Materials
Module 31-6	Certification and Qualification of Quality Control Inspectors
Module 31-7	Auditing for Quality Assurance
Module 31-8	Document Handling, Storage and Retrieval for Quality Assurance

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This module was prepared for General Physics Corporation by Jim Pritchard and John Espy of General Physics Corporation.

GENERAL PHYSICS CORPORATION

1979

INTRODUCTION

The Nuclear QA/QC Technicians can be responsible for conducting surveys and audits of records storage to verify that required records have been collected, indexed and stored such that the records are preserved throughout their storage period. Also, the technician may have responsibilities for validating the authenticity of certain records prior to their release for storage. In either case, the technician should be knowledgeable of the requirements of the records management program.

This module describes the records management program for the collection, storage, and maintenance of records. It first describes the scope of the program in terms of quantity of records and numbers of record types. It then describes the elements of the program which include receipt, indexing, storage, retrieval, and disposition. Integral with these descriptions are typical quality control checks which verify quality of records and adequacy of practices for processing and storing records.

MODULE PREREQUISITES

All of the previous modules of this course should have been completed before proceeding to this one.

OBJECTIVES

Upon completion of this module, the student/trainee can:

1. Define the term "records" as it pertains to the collection, storage, and maintenance of records for nuclear power plants.
2. State four acceptance criteria for determining record quality.
3. State two classifications of records as required by the Nuclear Regulatory Commission and describe the significance of each classification with respect to records storage.
4. Describe the role of indexing with respect to the records management program.
5. Describe the role of a separate, remote, duplicate record storage areas.
6. Describe environmental controls and filing practices typically used in records storage facilities.
7. Name two features of the records storage system which are subject to internal audits.

SCOPE OF RECORDS MANAGEMENT

Definition

For nuclear power plants, records are defined as "those records which furnish documentary evidence of the quality of items and of activities affecting quality; a document is considered a quality assurance record when the document has been completed." This definition includes as records considerably more than data forms which are completed by inspection and test activities. It includes all documents necessary to characterize the quality of items by inference or result. For example, a drawing characterizes the inferred quality of an item and inspection and test records characterize the results of such inspections and tests. The definition of records also includes documentary evidence of activities affecting quality. Continuing the foregoing example, procedures governing drawing preparation, approval, and release are records as are procedures governing performance of inspections and tests.

Record Types

Types of records can be considered in many ways. Records can be grouped by their purpose, format, material, and other means. In order to clarify the scope of records management programs, a discussion on types of records, grouped by general purpose of the records, is appropriate. General purposes of records can be grouped as (1) specifying item characteristics to be met, (2) stipulating who does what, when, where, and how, (3) documentary results of inspection, tests and verifications and (4) providing indirect but supporting evidence of quality.

Records which specify item characteristics to be met are primarily specifications, drawings, and technical procedures. These documents set forth the design of the item and all subsequent technical requirements to be met by the activities of procurement, fabrication, construction, operation, and maintenance. The products of the design activity are specifications, drawings, and procedures which characterize items on paper. These documents are used and amplified by supplementary specifications, drawings, and procedures in each of the foregoing activites. Thus, this category of records includes design, procurement, fabrication, construction, operation and maintenance documents which set forth on paper the characteristics to be displayed by items represented by each document.

Records which stipulate who does what, when, where, and how are procedures and instructions which, in turn, may require use of specifications and drawings as an integral part of the procedure or instruction. Such procedures and instructions are developed and implemented by each activity affecting quality. Each organization who performs activities governed by one or more of the eighteen quality assurance criteria of 10CFR50, Appendix B is required to have procedures and instructions which describe the activities. These procedures and instructions provide documented envidence of activites affecting quality and are therefore considered to be records.

Records which document results of inspections, tests, and verifications include a wide variety of records. These records are generated by fabricators, constructors, operators, and maintenance organizations. They document as-built item characteristics for everything from material properties to performance in service.

Records which provide supporting evidence of quality include those which document qualifications, audits, independent analyses and tests, item performance reports, and records of supporting activities such as shipping, handling, and storage. Qualification records provide evidence of qualifications of procedures, personnel and equipment, where such qualification is required and its records include quality assurance audit reports and responses thereto. Independent analyses and tests records include results of engineering analyses or special product tests which serve either as independent checks on quality or "referee" decisions on disputed issues. Item performance reports include a variety of quantitative and qualitative reports which provide information on trends, reliability, or other performance measures.

The foregoing discussion of record types is intended merely to indicate the large variety of records. A discussion on records materials would identify types by bound items, 8½" x 11" paper forms, 8½" x 16" forms, drawings of at least four sizes and using at least three different materials as masters, radiographs, strip charts, circular charts, ink tracings, heat tracings, and others. It should be obvious that many types of records exist for the nuclear power plant. It is realistically estimated that there are 2000 record types which must be handled by the nuclear plant owner's records management system.

Record Classes

Records required by the Nuclear Regulatory Commission to be retained are classified as either lifetime or non-permanent. Lifetime records must be retained by the owner for the life of the particular item represented while it is installed in the plant or stored for future use. Lifetime records are those which meet any of the following criteria:

- records which would be of significant value in demonstrating capability for safe operation.
- records which would be of significant value in maintaining, reworking, repairing, replacing, or modifying the item.
- records which would be of significant value in determining the cause of an accident or malfunction of an item.
- Records which provide required baseline data for the inservice inspection program.

Nonpermanent records are those which show evidence that an activity was performed in accordance with the applicable requirement but which do not meet the criteria for lifetime records. Retention periods are established for nonpermanent records which range from one year to about six years.

Guidelines on categorization of records including suggested retention periods are given by American National Standard ANSI A145.2.9, "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants." This standard is typically adopted via licensing commitments.

In addition to records required by the NRC to be retained, utilities typically place additional records into the records management program. Such additional records are those

representing plant systems which are not safety-related systems. Such records are used for essentially the same purposes as NRC required records. Therefore, most utilities have a classification scheme for all records similar to that in Table 31-8-1.

Table 31-8-1

Typical Utility Records Classification Scheme

Class	Class Description	Typical Quantity (1)
1	Required by federal, state, and local regulations (2)	8,000,000
2	Required for efficient station operation, maintenance, administration	5,000,000
3	Desirable to retain on a temporary basis	2,000,000
4	Others; not entered into program	5,000,000

NOTE: (1) Typical quantity at beginning of operational phase in number of pages.
(2) Includes lifetime and nonpermanent records.

Quantity of Records

The volume of records has steadily grown in recent years. As illustrated in Figure 31-8-1, twenty-five million pages of records can be generated by the design, procurement, and construction phases. In addition, the operations phase adds some thirty thousand pages of records per year.

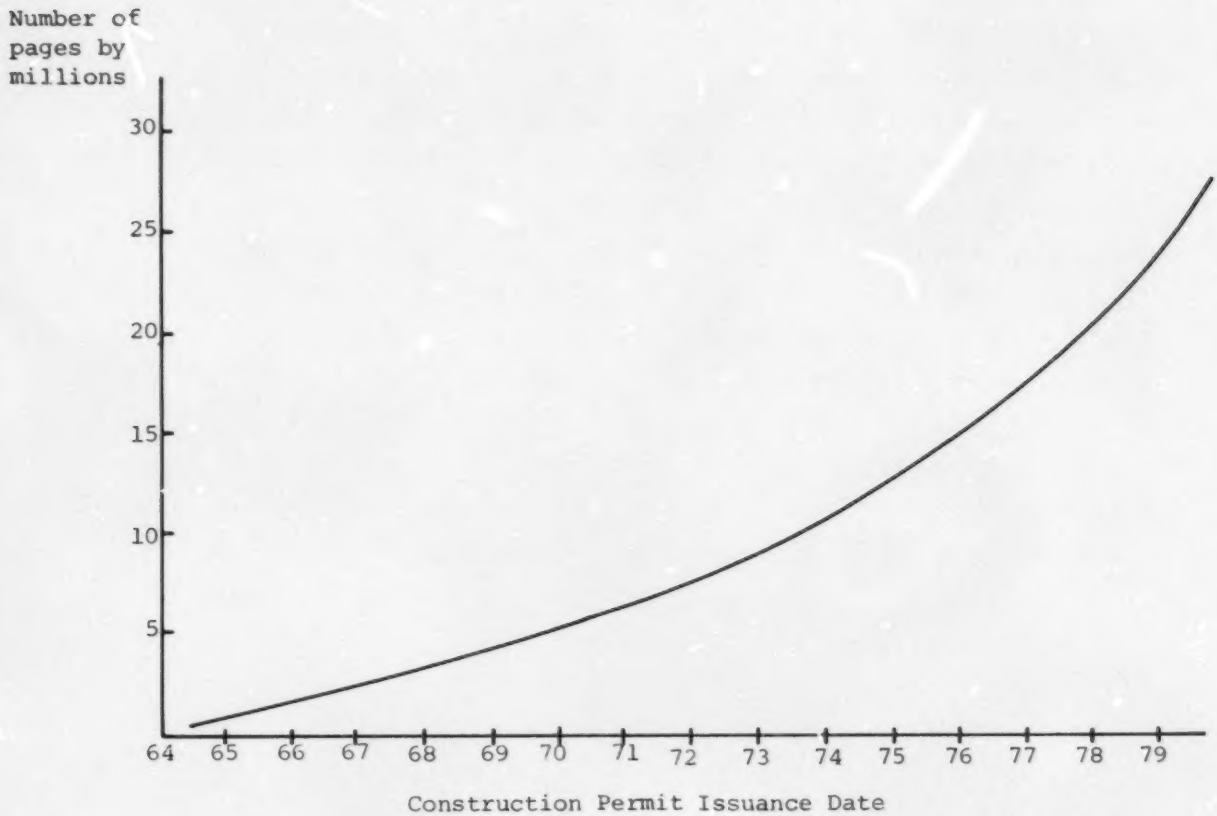


Figure 31-8-1 Design and Construction Documents Versus Construction Permit Issuance Data

Owner Responsibility

The Nuclear Regulatory Commission requires each licensee of nuclear power plants to collect and maintain at the plant site or available thereto sufficient records to document the design, as-built condition, and performance of all safety related plant systems. This regulatory body requires the licensee to collect from the numerous contractors many of the records previously described. Because each contractor tends to use somewhat different records systems, the records management problem is further complicated. However,

it is the responsibility of the owner of the nuclear facility to inspect, classify, and index received records and to reject such records if inadequate.

Elements of Records Management Program

The records management program is comprized of five elements: receipt, indexing, storage, retrieval, and disposition. As indicated by these elements, records management deals with completed records and not with the generation of records. All other activities of the quality assurance program generate records. Once records have served their immediate need within the generating activity, the records are forwarded to point(s) of collection for processing. Processing consists of indexing and storing records so that they are retrievable when needed and for discarding after expiration of designated retention periods.

THE RECORDS MANAGEMENT PROGRAM

General

The records management program is planned and documented by procedures as an integral part of each organization's quality assurance program. These programs include distribution of records through the contracting chain to customers as required by contracts. The owner of the nuclear power plant, by having ultimate responsibility, is faced with the more complicated program in that designated records accumulate at the plant site from a variety of contractors.

Each organization is responsible for implementing a records management program at the earliest practicable time consistent with the work schedule for accomplishing activities. These programs may handle records entirely

manually or may use computerized programs. Each program is required to accomplish two basic objectives: (1) designate the retention period of each record type and (2) permit retrieval of records without undue delay. Retention periods are based on categorization of records as lifetime or nonpermanent. Retrieval of records without undue delay is dependent on adequate indexing, storage, and issue practices.

A "central file" concept finds wide use in providing a records processing system which satisfies the two basic objectives. The central file system is illustrated in Figure 31-8-2. This system provides a central point for the receipt and processing of records. As indicated in the figure, processing includes the elements of (1) receipt, (2) classification, (3) reproduction, (4) indexing, (5) storage, and (6) retrieval/disposal. These processing elements are required of any records management system whether the central file concept is used or not.

Receiving of Records

The quality of records is verified at the point of receipt for entry of records into the records management program. While originators of records are responsible for preparing quality records, such quality is checked prior to processing records for storage. As a minimum, records must meet the following criteria:

- legible
- completely filled out
- adequately identifiable to the item involved
- authenticated by stamp, initial signature, or other means by authorized persons
- dated

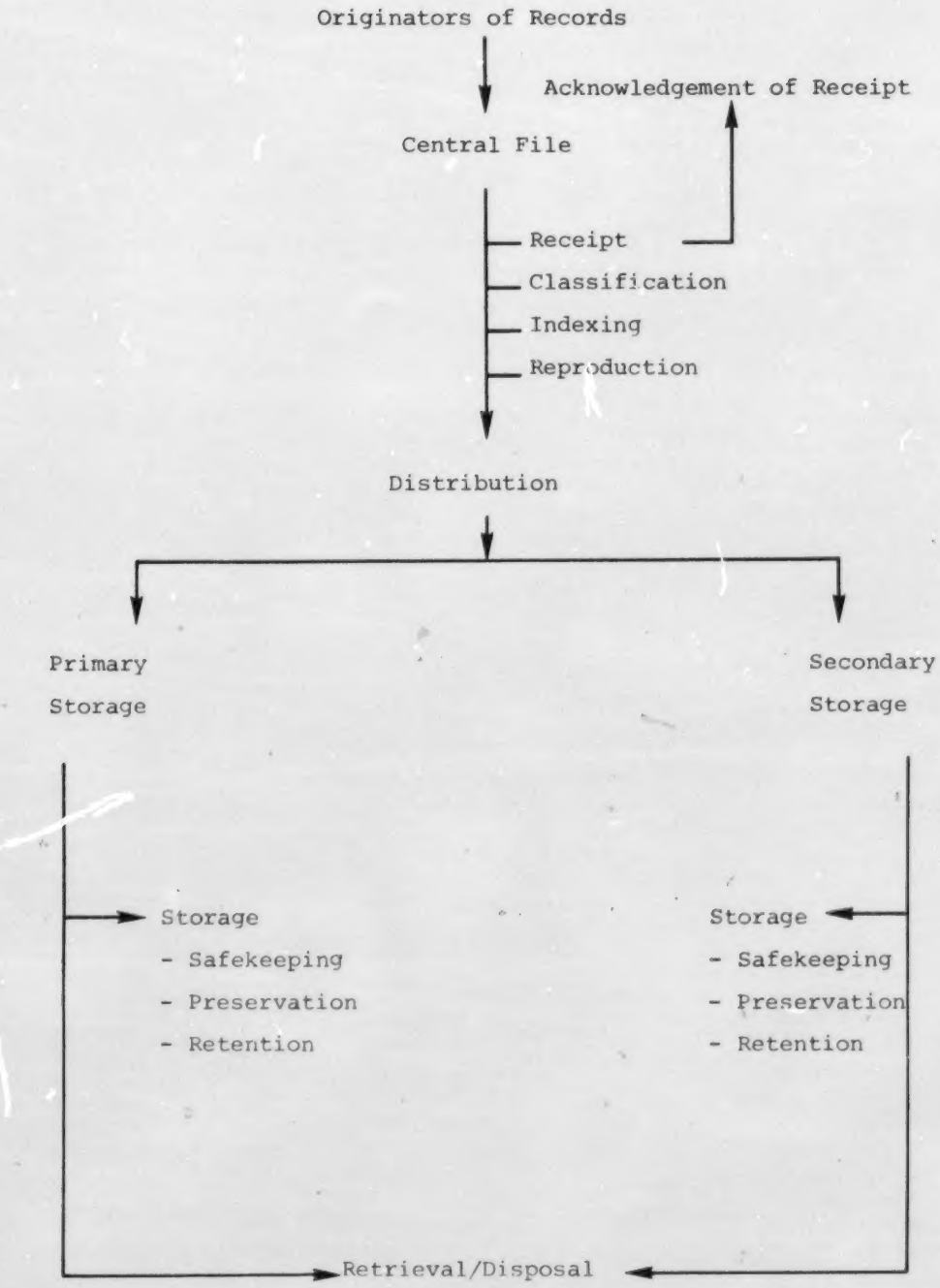


Figure 31-8-2 Central File Records System

The owner's records management program includes procedures for receipt of records. Such procedures designate responsibilities for receiving and inspecting records and for recording which records have been received.

Classification

Upon receipt of records, the owner shall determine the class of record from criteria such as that listed in Table 31-8-1 previously given.

The classification procedure is necessary to preclude excessive record processing and to assure that only permanent or semi-permanent (important) records are retained and maintained as required by ANSI N45.2.9 "Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants."

Indexing

Records to be stored are listed in an index to facilitate retrieval. The method of indexing varies with the particular records storage system used. As a minimum, the location and retention period for each record is recorded.

Whenever a need exists for retrieving a record, the index is consulted to determine the specific location of the record in storage. Experience indicates that a complete description of a record may not be known at the time retrieval is requested. For example, a question might arise pertaining to the original radiograph of a particular weld joint which was made during the construction period. Weld joint number and system nomenclature would be known.

The test of the indexing system would be whether the known identifiers are sufficient to locate the record.

Most utilities index records by a number of indexing parameters to permit record retrieval from a variety of known identifiers. Such an approach permits maximum flexibility in what must be known in order to retrieve a record. However, the number of document identifiers used for indexing adds to the complexity of the system. Manual systems tend to use few document identifiers and therefore offer least flexibility while computer aided systems tend to use more document identifiers and therefore give considerably greater flexibility.

When computer aided retrieval systems are used, the indexing parameters are inputed to the computer memory and a sorting program is used to permit computer identification of the record by any one or combination of the indexing parameters. A typical set of document identifiers for computer aided retrieval systems is illustrated by Figure 31-8-3. Knowledge of any identifier permits computer identification of all records having that identifier. As additional identifiers are known, the list of documents having such identifiers decrease and the time necessary to locate the exact record of concern is reduced.

Reproduction

The need for reproduction of records depends on the type of storage to be used as received records are termed "hard copy." If the hard copy is to be stored, the only need for reproduction would be those cases where a duplicate storage copy is desired. But if micrographics are to be used, specific reproduction processes are necessary. Thus, the potential reproduction methods include (1) copier machine, (2) roll microfilm, (3) aperture cards, and (4) microfiche. The latter three are specific types of

DOCUMENT INDEX DATA SHEET

Film Access Number

Field No	Descriptor	Data
1	Record Classification	
2	Document Number	
3	Sheet Number	
4	Revision Number	
5	Record Type (Name)	
6	Date	
7	Title	
8	Cross Reference Number	
9	Purchase Order Number	
10	Vendor Name	
11	System, Equip. Identifier	
12	Component Type	
13	Serial, Part Number	
14	Location	
15	Originator (Person, Company)	
16	Receiver (Person, Company)	
17	Utility Index Number	
18	Action Required	
19	Keywords	

Indexer _____ Checker _____ Verifier _____ Audit _____

Figure 31-8-3 Sample Document Index Data Sheet

micrographics which have the following advantages over hard copy:

- reduces storage space by as much as 95%
- allows positive control of records
- reduces probability of lost records
- assures archival quality of records.

Each reproduction media has its advantages which tend to make it used for certain types of records. Each media and its typical application are listed in Table 31-8-2. As indicated in the table, certain records do not lend themselves to reproduction and are therefore stored as hard copy.

As previously indicated in Figure 31-8-2, duplicate records are desirable. One set is used as the "working file" from which records are retrieved for use as needed. The other set is a nonworking file whose purpose is to be available for reproduction in the event the working file record is lost or damaged to an extent that it is not useable. Nonetheless, Table 31-8-2 indicates that certain records are either not reproducible or so subject to change as to warrant storage of the hard copy. As described later in this module, the storage system has levels of protection based on whether duplicates are available.

When micrographics are used, two sets of micrographics are typically made and the hard copy is then destroyed. Prior to destruction of the hard copy, it must be positively ascertained that quality micrographics have been made. Process control for micrographics is typically that, illustrated by Figure 31-8-4. As indicated by the figure, hard copies are retained until the micrographics are developed, inspected for quality, and verified as completely reproducing that hard copy. The initial filming produces two originals where possible, e.g., double roll with simultaneous exposure. Both originals are verified. Reproduction

Table 31-8-2

Reproduction Media

Type	Application	Limitations
16mm Roll Microfilm	Standard width records of any length which are not utilized. Approximately one file drawer of hard copy can be placed on one roll. Provides duplicate rolls and 40 year archival quality. Examples, inspection report, strip chart recording.	Limited to records of about 14" or less in smallest dimension; does not permit easy revision of documents which have been filmed.
Microfiche	Unitized documents such as manuals and safety analysis reports. Facilitates rapid revision of documents.	Requires retention of master hard copy for easy incorporation of revisions.
Aperture Cards	Drawings of all sizes and other large dimensioned documents.	Hard copy master must be retained for easy incorporation of revisions.
Hard Copy	Documents not suitable for micrographics due to size, marginal quality, or nature of record. Example, radiographs.	Large storage space.

of one of the originals is necessary only where satellite working files are also to be maintained.

Storage

The records management program must include written procedures for the storage of records. These procedures must (1) describe the storage area, (2) describe the filing system, (3) identify the method for verifying that records received for storage agree with the transmittal document and are in good condition, (4) prescribe rules for access to and control of the files, (5) prescribe rules for control

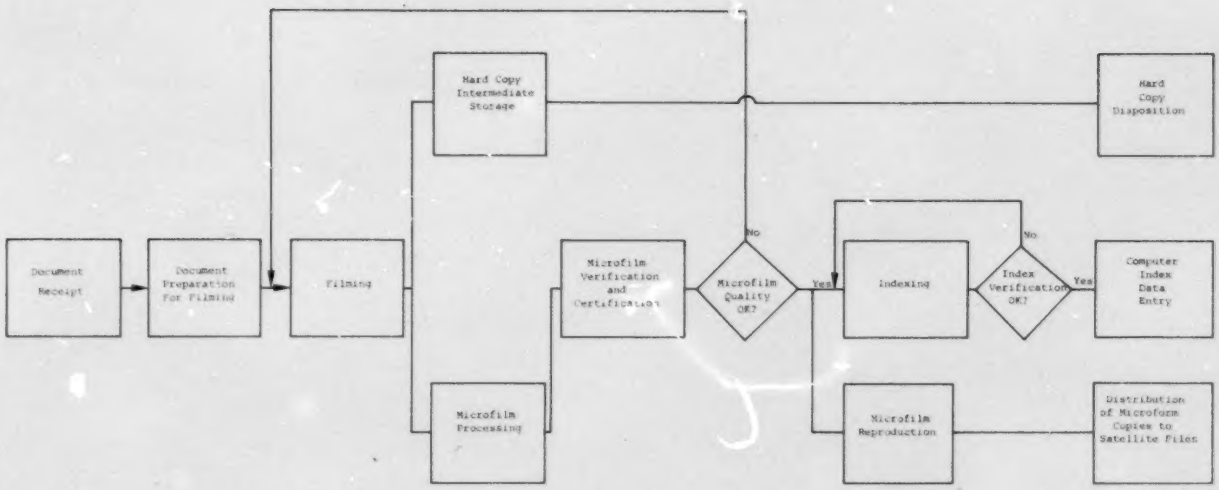


Figure 31-8-4 Document Processing for Micrographics Reproduction

and accountability of records removed from file, and (6) provide instructions on disposing of superseded records.

The storage area and specific conditions for storage must preclude deterioration of records for their full period of storage. For lifetime records, this requires preserving the record for as much as forty years. In general, storage areas include protection from condensation and storage of records in a manner suitable for the nature of the record. Condensation is typically avoided by heating and ventilation to maintain the storage area above the dew point. Air conditioning may be necessary for humidity control based on local circumstances. Records are not stored loose. Hard copy records are attached in binders or placed in folders or envelopes for storage on shelving in

containers. Special records which are sensitive to light, pressure, or temperature such as radiographs, micrographics, and photographs are stored in packages or containers recommended by manufacturer's of the materials.

Additional considerations for storage areas include consideration of protection against fire, flooding, tornadoes, insects, and rodents. The extent of controls in these areas is dependent on whether duplicate records are kept at separate, remote locations. Fire protection is provided by constructing the records storage area of materials which give it a four hour fire rating and by prohibiting ignition sources in the primary or permanent records storage area. Additionally, a fire suppression system is typically installed unless duplicate records are maintained elsewhere. For those special records, where duplication is not practicable, special storage containers within the storage area may provide ample protection. For example, radiographs may be stored in light proof envelopes which are placed in special metal containers designed for storage of radiographs.

Controls are established for records storage areas to guard against loss of records. These controls typically include (1) designation of those persons authorized to retrieve records, (2) locking, and possibly alarming, access portals when the area is unattended by authorized persons, and (3) controls over the issuance of records from storage. With regard to issue of records from storage, controls typically include a sign out system as a minimum. Additional controls depend on such factors as whether duplicates exist, whether a copy can be made for issue, and whether the record can be used without its leaving the storage area.

Retrieval/Disposition

The records arrangement system must provide for retrieval of records without undue delay. The extent of acceptable delay is a judgement of consideration. If the exact record is known, a good system would promptly retrieve that record. But if few record identifiers are known, some time is required to sort through all possibilities to find the exact record. An analogy is finding cancelled personal checks from among last year's checks. If you file the checks in numerical order and want to find a given numbered check, it would not be too difficult. But, if you want to find a check to a given payee and you have no idea what number or date applies, it would be rather time consuming. However, in the latter case, if you have also indexed checks by payee, it would become much easier again.

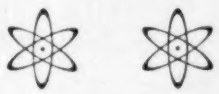
Disposition of nonpermanent records occurs at the end of their retention periods. Until confidence is gained in the designated retention periods, management may require their approval to destroy records as the first few storage expiration dates are reached. Otherwise, designated persons periodically purge storage areas of those nonpermanent records which have lived past their retention period.

Audits

Periodic audits of the records management system are required. These audits may be part of the quality assurance internal audit program and are required to check the following:

- received records are available and in designated storage areas.
- storage facilities are in good condition and temperature and humidity controls and other protective devices are functioning properly.

- documents are not deteriorating due to improper storage practices or rough handling.
- documents or copies thereof are legible and identifiable
- documents are properly indexed and retrievable
- personnel performing record management activities are competent and knowledgeable of requirements.



EXERCISES

1. Describe the roles of each principal element of the records management system by completing the right hand column:

Element	Role
Receiving	
Classification	
Indexing	
Storage	
Retrieval/Disposal	

2. List five acceptance criteria for determining the quality of records.

3. Describe typical environmental controls and records filing practices in a records storage facility.

4. Audit a records storage facility as outlined in the Procedures section of this module, and prepare a report on the audit.

MATERIALS

Reference copy of ANSI N45.2.9
Copies of typical records.

PROCEDURES

As requested in Exercise 4 of this module, perform the following:

1. Audit a records storage facility at your institution or site. Check practices in the following areas:
   a. receipt of records for storage
   b. classification

c. indexing
d. filing
e. retrieval
f. storage facility environmental controls
g. storage facility fire protection

2. Prepare a report of the foregoing audit of a records storage facility and discuss reports in class. Include recommendations for improvements and rationale therfore.

3. Obtain a copy of ANSI N45.2.9 and discuss in class the listing of records in the appendix to this standard. Offer rationale for the designated retention periods.

DATA TABLE

None.

REFERENCE MATERIALS

ASME, Quality Assurance Requirements for Nuclear Power Plants, ANSI N45.2, the American Society of Mechanical Engineers

ASME, Requirements for Collection, Storage, and Maintenance of Quality Assurance Records for Nuclear Power Plants, ANSI N45.2.9, The American Society of Mechanical Engineers

TEST

1. Answer the following questions regarding records as either true or false.

   _____ Any document generated at a nuclear power plant is a "record" and must be placed in a formal records management system.

   _____ "Records" are official documents that can never be destroyed during the life of the power plant.

   _____ A record is a completed document that furnishes evidence of the quality of items and of activities affecting the quality of an item.

2. Records are required to be kept on certain items. Indicate as either true or false whether the following are examples of records.

   _____ A drawing of the item.

   _____ A procedure for testing the item.

   _____ Results of tests on an item.

3. Which of the following criteria must be met when determining the quality of a received record?

   _____ legible

   _____ on 8½" x 11" paper

   _____ dated

   _____ produced by the plant staff

   _____ completely filled out

4. Answer the following as either true or false.

   _____ Records required by the Nuclear Regulatory Commission to be retained are classified as lifetime or non-permanent.

5. Select the most correct statement.

   (a) Lifetime records may never be destroyed.

(b) Lifetime records must be retained for the lifetime of the plant.

(c) Lifetime records must be retained for the life of the particular item while it is installed on or stored for future use.

6. Describe the role of the following elements of records management program:

a. indexing

b. duplicate storage area

7. Describe environmental controls typically used in a records storage facility.

8. Describe filing practices typically used in a records storage facility.

9. Audits are required for the records management program; name two features which are checked by these audits.